

ARCTIC SCIENCES DIVISION

QUESTIONS and REPORT TEMPLATE for FY 2009 NSF COMMITTEE OF VISITOR (COV) REVIEWS

Guidance to the COV: The COV report should provide a balanced assessment of NSF's performance in two primary areas: (A) the integrity and efficiency of the **processes** related to proposal review; and (B) the quality of the **results** of NSF's investments that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. Discussions leading to answers for Part A of the Questions will require study of confidential material such as declined proposals and reviewer comments. *COV reports should not contain confidential material or specific information about declined proposals.* Discussions leading to answers for Part B of the Questions will involve study of non-confidential material such as results of NSF-funded projects. The reports generated by COVs are used in assessing agency progress in order to meet government-wide performance reporting requirements, and are made available to the public. Since material from COV reports is used in NSF performance reports, the COV report may be subject to an audit.

We encourage COV members to provide comments to NSF on how to improve in all areas, as well as suggestions for the COV process, format, and questions. For past COV reports, please see <http://www.nsf.gov/od/oia/activities/cov/covs.jsp>.

**FY 2009 REPORT TEMPLATE FOR
NSF COMMITTEES OF VISITORS (COVs)**

Date of COV: Oct. 28-30, 2009
Program/Cluster/Section:
Division: Arctic Sciences Division
Directorate: Office of Polar Programs
Number of actions reviewed: 136 Awards: 67 Declinations: 69 Other:
Total number of actions within Program/Cluster/Division during period under review: Awards: Declinations: Other:
Manner in which reviewed actions were selected: Random selection of 136 ejackets for years 2007, 2008, and 2009, constrained to yield 50% awards and 50% declines.

PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

A.1 Questions about the quality and effectiveness of the program's use of merit review process.

Provide comments in the space below the question. Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE ¹
<p>1. Are the review methods (for example, panel, ad hoc, site visits) appropriate?</p> <p>The COV was generally impressed with the thoroughness and quality of the overall review process. The review methods employed by the various programs were appropriate, and the combination of <i>ad hoc</i> and panel reviews was thought to be particularly effective in evaluating proposals. Several panel members noted that it is more difficult to evaluate the review process for proposals for which only panel reviews were obtained, or situations with less than 3 good <i>ad hoc</i> reviews. <i>Ad hoc</i> reviewers were usually easily identified as specialists in the field(s) of the proposal under review, while this was less obvious in the case of panel reviewers. As a result, <i>ad hoc</i> reviewers could offer a more informed assessment of the proposal. The panel felt it had a better sense of the research community's sentiment regarding the quality and feasibility of the proposed research if at least 3 <i>ad hoc</i> reviews had been obtained. The COV panel did acknowledge, however, that there are times when panel only reviews are appropriate and can be effective. Nevertheless, as noted in an earlier COV review, increasing the proportion of proposals that are reviewed by external evaluators should be a goal for each reviewed proposal. This COV panel concurs and makes some recommendations in this regard later in the report.</p> <p>There appeared to be different strategies and practices across programs with respect to whether panelist verbal rankings were included in the panel summaries or Review Analysis. Panel-only reviews often did not have rankings, and panel summaries were typically briefer and less informative in such cases. The COV reviewers found it easier to assess the proposal review process when these reviews were ranked and clearly included in the documentation.</p> <p>In general, Review Analysis documents were found to be the most effective documents in the 'paper trail' in clarifying the decision process with respect to funding or declining proposals. Many of the award/non-award letters contained substantial portions of the Review Analysis documents and were impressive. The COV encourages this to continue, perhaps even including more of the Review Analysis in those letters.</p>	YES

¹ If "Not Applicable" please explain why in the "Comments" section.

Source: Jackets, EIS (type of review module)	
<p>2. Are both merit review criteria addressed</p> <ul style="list-style-type: none"> a) In individual reviews? b) In panel summaries? c) In Program Officer review analyses? <p>Both merit criteria were consistently addressed, usually extensively, in Review Analysis, and generally, although less extensively, in panel summaries. The results were more heterogeneous with respect to individual external reviewers. While most reviewers at least commented on Broader Impacts, a surprising number either did not mention them at all, or explicitly noted they were basing their review solely on intellectual merit.</p> <p>Source: Jackets</p>	YES
<p>3. Are IPY review criteria (as set forth in the solicitation) addressed</p> <ul style="list-style-type: none"> a) In individual reviews? <p>Individual reviews were quite heterogeneous in this regard. Some detailed their reviews to each of the specific IPY criteria, many noted them briefly in passing, and a fair number mentioned neither IPY nor the review criteria.</p> <ul style="list-style-type: none"> b) In panel summaries? <p>While most panel summaries noted the IPY review criteria, and how the proposal related to them, the discussion of this in panel summaries was typically cursory. A few panel summaries of IPY proposals did not even mention IPY.</p> <ul style="list-style-type: none"> c) In Program Officer review analyses? <p>Program officers routinely addressed the IPY review criteria for each proposal in the Review Analyses.</p> <p>It was the COV panel's opinion that many individual reviewers simply viewed IPY proposals as indistinct from the types of proposals normally submitted to programs in OPP, and reviewed them accordingly. Although another IPY will not occur anytime soon, the COV panel suggests that review criteria particular to future special solicitations be emphasized and differentiated from standard review criteria.</p> <p>Source: Jackets</p>	YES, but variable
<p>4. Are reviewers effective at identifying strengths and weaknesses of disciplinary as well as interdisciplinary and multidisciplinary proposals?</p> <p>Generally, yes. In several instances, reviewers noted the interdisciplinary nature of the proposal under review, and in all cases this was viewed as a strength of the proposal. In</p>	YES

<p>cases where proposals could be identified as inter- or multidisciplinary, no issues of concern were identified in the review process or decision outcome. In general, the panel felt that inter-/multidisciplinary proposals were adequately reviewed and handled by panels and program managers.</p> <p>Source: Jackets (reviews, panel summaries, review analyses)</p>	
<p>5. Do the individual reviewers provide substantive comments to explain their assessment of the proposals?</p> <p>The vast majority of individual reviews were substantive and appropriate commentaries on the proposed research, methodology, etc. Only a few individual reviews were characterized as ‘content free’. There was, however, one proposal that, in the opinion of the COV panelist who reviewed it, had no substantive reviews from either the <i>ad hoc</i> reviewers or the panel. As a single case, this was considered a very rare event.</p> <p>The COV panel discussed the frequency with which reviewers commented on the strength of the research/productivity of the PI (especially of more senior investigators), but did not find this unduly influenced the decision to fund or decline.</p> <p>Source: Jackets</p>	YES
<p>6. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)?</p> <p>In many cases, whether consensus was reached on any individual proposal was difficult to discern from the panel summary. Several panelists viewed the panel summary as the weakest component of the documentation trail.</p> <p>Source: Jackets</p>	NO
<p>7. Does the documentation in the jacket provide the rationale for the award/decline decision?</p> <p>Yes. Almost without fail, the program officers’ Review Analyses were well-reasoned and explained clearly both how and why the funding decision was reached. In most cases, the information was also contained in the panel summary, although in less clear and detailed fashion. We noted that the panel summaries often did not list the final decision of the panel (“recommend highly”, “recommend”, or “do not recommend”), although we knew from our own experiences and from many of the Review Analyses that the panel had indeed made such recommendations. For the sake of review integrity, POs should ensure that the panel recommendation is documented in the jackets.</p> <p>(Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.)</p>	YES

<p>Source: Jackets, review analyses</p>	
<p>8. Does the documentation to the PI provide the rationale for the award/decline decision?</p> <p>In general yes. In a few ejackets reviewed by the COV the information provided by the PO to the PI was very detailed. These cases reflected a mature portfolio management decision-making process; looking at the proposal not only with respect to proposal merit but also in the context of the proposal's overall fit into the program's portfolio, and conveying the information to the PI. But in many more cases it was not clear what exactly was sent to the PI informing them of the program decision. It appears to be standard practice that program managers email PIs with respect to review outcomes, but in many cases these notifications have not been loaded into the ejacket system to become part of the permanent record. This became an issue of discussion for the COV panel members because it was not clear as to why so many reviews and panel summaries in the ejackets were listed as 'not released'.</p> <p>RECOMMENDATION: Make the bulk of the content in the Review Analysis available to PIs (with reviewers' names excised). These documents are much richer with respect to the decision making process and review weighting components that are often missing from the panel summary. Providing Review Analysis or similar document to PI in case of declines will help avoid the common practice of misinterpreting the overall significance or weight of individual review and panel comments in the final decision. Having more complete analysis would allow resubmissions to be targeted more effectively where the most benefit to the science could result most easily.</p> <p>The COVs concern with this recommendation is that POs might feel constrained in preparing Review Analyses for public consumption, and their quality and informativeness would correspondingly decline. This would defeat the purpose of the recommendation. The COV review panel also does not want to increase the already heavy workload of the POs. An alternative is to formally encourage POs to continue to rely heavily on their Review Analyses in communicating the results of panel deliberations to PIs (e.g., by 'cutting & pasting' sections of the Review Analysis into the email notifications).</p> <p>(Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.)</p> <p>Source: Jackets, Reviews, Panel Summary, and PO Comments or an E-mail uploaded in Diary Notes</p>	<p>YES</p>

<p>9. Does the documentation to the PI provide the information on logistical factors that influenced the award/decline decision?</p> <p>No. In general, the panel did not identify issues of logistics costs in the information returned to PI regarding funding decision. Although a few proposals were noted where budgets were adjusted in response to logistic costs, it was not a pervasive practice. Of the 136 proposals considered, 26 required support from the NSF logistics provider and at least 6-7 required icebreaker or other large ship support. Despite the apparent absence of information on logistical factors in the decision information provided to PIs, the panel concluded this was unlikely to be a serious problem.</p> <p>Source: Jackets, PO Comments of E-mail in Diary Notes</p>	<p>NO</p>
<p>10. Is the time to decision appropriate?</p> <p>We noted that dwell time increased sharply after 2005. Average dwell time in FY08 and FY09 was over 9 months, significantly up from the Arctic division's earlier dwell time statistics during 2000-2005. We were particularly concerned by 5 proposal dwell time outliers, each exceeding 20 months. Although these were clearly anomalies, we unanimously agreed that NO proposal should be in limbo for that long.</p> <p>Among the proposals in the three years of the COV purview, only 20% were cleared within 6 months in 2007, while in 2008 & 2009 the proportion is below 10%. In Arctic Science, the NSF-wide target of informing 70% of PIs within 6 months of submission is taking 3 months longer than it should. We note that a 9 month dwell time is particularly problematic for young investigators who need this time to make significant revisions prior to resubmission.</p> <p>The dramatic increase in dwell time is illustrated in the following graphs:</p> <div data-bbox="107 1337 974 1728"> <p>The first graph, titled 'Impact of ARRA on dwell time in FY09', shows the percentage of proposals awarded or declined on the y-axis (0% to 100%) against dwell time in months on the x-axis (4 to 15). It compares 'Awards FY09' (green line) and 'Declines FY09' (red line). Both lines show a sharp increase in the percentage of proposals as dwell time increases, with awards reaching 100% at 11 months and declines reaching 100% at 12 months. A label 'FY06&07' points to the green line.</p> <p>The second graph, titled 'Dwell Time for Awards and Declines', shows the percentage of proposals awarded or declined on the y-axis (0% to 100%) against dwell time in months on the x-axis (4 to 15). It compares 'Awards FY06-07' (green line) and 'Declines FY06-07' (red line). Both lines show a sharp increase in the percentage of proposals as dwell time increases, with awards reaching 100% at 11 months and declines reaching 100% at 12 months.</p> </div> <p>We recognize that there are several possible causes for this dwell time increase: (1) individual programs have gone from 2 annual submissions to a single submission deadline; (2) proposal pressure to ARC has generally increased (<330 proposals/year during 2000-2004 increasing to around 400 proposals per year during 2005-2009, and a particularly high load of 573 proposals in 2007 for the IPY); (3) the prospect of stimulus</p>	<p>NO!</p>

<p>funding in early 2009 led to declines being delayed longer than usual and when the funding was provided it resulted in a very substantial increase in PO workload.</p> <p>We offer several RECOMMENDATIONS for OPP to consider:</p> <ul style="list-style-type: none"> a) process the obvious declines as soon as possible after panels; simply processing the obvious declines two weeks earlier would result in ~60% of proposals being cleared within six months, b) for the period 2009-2012, track these dwell-time metrics at the end of each specific solicitation to evaluate whether the issue is being adequately dwelt with, and c) consider whether moving back to 2 target deadlines per year instead of 1 would significantly affect dwell time without other negative impacts. <p>Note: Time to Decision --NSF Annual Performance Goal: For 70 percent of proposals, inform applicants about funding decisions within six months of proposal receipt or deadline or target date, whichever is later. The date of Division Director concurrence is used in determining the time to decision. Once the Division Director concurs, applicants may be informed that their proposals have been declined or recommended for funding. The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals. COV members should be aware that in 2009, the American Recovery and Reinvestment Act (ARRA) may have affected this; the committee may find it fruitful to differentiate between 2009 proposals and those acted upon prior to 2009.</p> <p>Source: Jackets, EIS Web COV Module (Select "Report View," then "Average Dwell Time," then the program or combination of programs of interest).</p>	
<p>11. Additional comments on the quality and effectiveness of the program's use of merit review process:</p> <p>Especially for new PIs, it would be helpful for POs to provide more detail for revision recommendations in the decline letter, or more directly encourage PIs to contact the PO directly for specific guidance. While this is done in many instances, it should be regularized. The Recommendation made in question A.1.8 speaks directly to this issue.</p> <p>As noted above, some panelists were disheartened by the small number of mail reviews in jackets. The panel recognizes the phenomenon of review fatigue in the research community, but some proactive approach that results in more <i>ad hoc</i> reviews would be beneficial. One suggestion is to change the review solicitation mechanism in FastLane. Requiring review commitment within a short-time frame, and an automatic email reminder if the response is not forthcoming might help. Similarly, an email reminder to send a promised review if it is over a week late might also increase the ad hoc review rate. It also would be helpful to move the commitment statement to the top of the letter requesting the review so that it is obvious.</p> <p>In general, the panel was very impressed with the thoroughness and fairness with which proposals are handled and reviewed in the Arctic Science programs. This was particularly impressive given the continued increase in proposals handled annually.</p>	

A.2 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE ²
<p>1. Did the program make use of reviewers having appropriate expertise and/or qualifications?</p> <p>With the <i>ad hoc</i> reviews, the COV almost always noted a clear match between reviewer expertise and proposal subject matter. There was one proposal noted for which none of the reviewers appeared to be experts in the required field, but in our full list of proposals, this was viewed as an outlier. When panel-only reviews formed the basis for an award or decline decision, there was often some question about the linkage between reviewer expertise and proposal research area. The panel did note that in some cases, for reviewers known personally to the COV panelists, the areas of expertise linked to reviewers were incorrect. It is frequently clear, based on the number of reviewers contacted, that program managers are trying hard to match reviewer expertise with proposal topics. Although a few minor anomalies were noted, the COV panel sees no need to offer recommendations for improvement in this category.</p> <p>Source: Jackets</p>	YES
<p>2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups?</p> <p>The panel felt it could not fully evaluate this query. It is clear that a broad, representative array of reviewers have been solicited by program officers, and we noted specifically that a large number of reviewers were from other countries. Whether individuals agree to provide reviews is beyond the control of program managers. Reviewers were drawn from both educational institutions and the public sector, and while no quantitative data were compiled, no panelists saw any reason to question the mix of reviewers overall.</p> <p>Note: Demographic data is self reported, with only about 25% of reviewers reporting this information.</p> <p>Source: Jackets, EIS Web COV Module “Report View,” then many choices. The EIS draws from an active reviewer database, so data pulled does not reflect the situation at the time of review (e.g. reviewer can change institutions and then all past reviews are shown with the reviewer’s current institution).</p>	DATA NOT AVAILABLE
<p>3. Did the program recognize and resolve conflicts of interest when appropriate?</p> <p>In general, yes. There was one proposal where two very critical <i>ad hoc</i> reviewers also</p>	YES

² If “Not Applicable” please explain why in the “Comments” section.

<p>had proposals under review at the same panel. This was not commented on in the jacket, nor did the reviewers self-identify the COI in their reviews. This type of COI should be closely monitored, and usually is. The panel viewed this as a rare and unusual case. In a few other cases, COIs were noted in the jacket, and how the COI was handled described by the program director. It is the COV panel's view that due diligence is being done in this regard.</p> <p>Source: Jackets</p>	
<p>4. Additional comments on reviewer selection:</p>	

A.3 Questions concerning the resulting portfolio of awards under review.

Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE ³ , OR DATA NOT AVAILABLE
<p>1. Overall quality of the research and/or education projects supported by the program.</p> <p>Uniformly high quality projects have been supported by the program. No one felt there was any significant bias in the nature of awards or declines. However, in one instance, a panelist considered that the program manager's views and decision were at considerable variance with the reviewers and panelists, and that the summary provided in the Review Analysis was in opposition to the written reviews and program summary. In one other instance, a very highly rated proposal was declined with the explanation that the research was not arctic research, but a global topic that just happens to be taking place in the arctic. These instances were also viewed as outliers.</p> <p>Source: Jackets, Highlights, Program Information</p>	YES
<p>2. Does the program portfolio promote the integration of research and education?</p> <p>The panel found it difficult to evaluate this question at a programmatic level, but it is clear that many individual investigators are concerned with training students, post-docs, and regularly engage in public outreach educational efforts. In this context, the funded projects do represent a significant effort at the integration of science and education. The panel did note some cases where education workshops had been funded, and individual projects whose broader impacts and educational efforts positively affected the decision to fund. This suggests a programmatic commitment to the integration of science and education in the portfolio.</p> <p>Several projects included in the NSF highlights stand out as examples of the integration of research and education. These include the Narwhal Tusk research of Nweeiao (ASSP, 0630651) the Adak Archaeology project of West (ASSP, 0353065), and the Disseration Research project on Anaktuvuk Pass of Anderson (ASSP, 0352798).</p> <p>Source: Jackets, Highlights, Program Information</p>	YES
<p>3. Was research and education effectively integrated in IPY grants?</p> <p>Yes, See above.</p>	YES

³ If "Not Appropriate" please explain why in the "Comments" section.

Source: Jackets, Program Information	
<p>4. Are awards appropriate in size and duration for the scope of the projects?</p> <p>The range of project sizes was sufficiently large as to make generalizations difficult. Without seeing final project reports, it appeared as though these considerations were taken seriously by some reviewers and certainly by program managers. The panel identified no cases where the size or scope of a project was seriously questioned. In some cases, budgets and project scope were altered in response to reviews, including logistic planning and budgeting. This suggests that project size and scope is appropriately managed by the program.</p> <p>To more thoroughly assess this question, the COV would require longer temporal review window (i.e., >3 years) to more completely analyze jackets that included completed projects.</p> <p>Source: Jackets, EIS Web COV Module "Report View" – Average Award Size/Duration. Note – NSF indicates the EIS COV Module is useful but a judgment will have to be made about size and duration in relation to the scope based on review of jackets.</p>	YES
<p>5. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Innovative/potentially transformative projects? <p>The evaluation of transformative projects is likely to only be possible after completion of funded projects. Hence, it is not possible to evaluate this question based on a sample of projects that are not yet completed, and some of which have barely started. It is the case, however, that a number of successful proposals were identified by external reviewers as being potentially transformative.</p> <p>Given the nature of identifying and evaluating the transformative nature of research projects, it is not clear that this is a reasonable question for COVs to address with a sample of only the three most recent years of funded projects.</p> <p>Based on the NSF highlights from 2007-2009, 10/37 projects were categorized as transformative in that summary. Given the breadth of project types highlighted (basic research to interdisciplinary research to infrastructure support to education), and the above caveat regarding timing, this proportion seems appropriate. The COV considered that the program portfolio includes an impressive number of innovative projects, and likely reflects an appropriate balance of potentially transformative projects, as well.</p> <p>Source: Jackets, Program Information</p>	DATA NOT AVAILABLE

<p>6. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Inter- and Multi- disciplinary projects? <p>In the sample of proposals examined, panels and reviewers only rarely commented on the inter- or multidisciplinary nature of the science. Of those that the panel could so identify, there appeared to be no bias in funding decisions. In this context the balance of inter- and multidisciplinary proposals across the program seems to be appropriate. The panel did note that most of science has become ‘interdisciplinized’, and that this is normative in most programs, including those reviewed here. Certain kinds of interdisciplinary research are more difficult to incentivize, especially in the social sciences. The arctic social sciences program has been particularly effective in promoting and funding such collaborations.</p> <p>In the highlighted projects from 2007, 2/13 projects were identified as interdisciplinary, while one was identified as multidisciplinary.</p> <p>The Arctic program generally does much better than other parts of the NSF in breaking down barriers between disciplines. It is easy for the natural science and social science communities to remain isolated from each other: this process begins at the level of PhD training where there is generally little overlap between disciplines, and as an individual scientist’s career unfolds, s/he tends to be entrained in a distinct scientific community with its own journals, jargon, conferences etc.. With the demise of the Arctic Program All Hands meetings, the opportunity for arctic scientists of different backgrounds to interact has been greatly reduced, thus hampering PI interactions that might lead to productive inter- or multidisciplinary research projects. We see the upcoming State of the Arctic conference as an important opportunity to rebuild social capital between scientific communities.</p> <p>Source: Jackets, Program Information (NSF suggests that co-funding with other programs (info in EIS) is a proxy for inter and multi-disciplinarity. This may not be appropriate for OPP as it is regional, not disciplinary).</p>	<p>YES</p>
<p>7. Does the program portfolio have an appropriate balance considering, for example, award size, single and multiple investigator awards, or other characteristics as appropriate for the program?</p> <p>In general, yes. We did not have sufficient information to determine how the funded investments “collectively” affected progress towards NSF mission and strategic outcome goals. However, through discussions, it appeared that the program actively applies both bottom-up and top-down techniques for managing its suite of programs, projects and other work within the organization, to facilitate optimization of current and future investments to achieve an investment strategy. Awarded proposals provide a pool of possible investments that best support the Program’s mission and objectives.</p> <p>Source: Jackets, Program Information, EIS Web COV Module for Award Size. Note – if EIS proves not to be useful for this question the judgment will have to be made on the jackets and questioning PO’s.</p>	<p>YES</p>

<p>8. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Awards to new investigators? <p>Yes. In the sample of proposals examined, 31 jackets were from new investigators while 105 represented submissions from more senior investigators. Among the proposals from new investigators 16 were awarded while 15 were declined. For senior investigators, 51 resulted in awards and 54 were declined. Given the strategy of sampling equal numbers of awards and declines, this suggests the funding rate for young investigators is not only appropriate, but encouraging. According to data made available in the ‘read ahead’ documents, 6 of 14 funded PIs in the IPY competition for ASSP were new investigators, while over half the ARRA funded projects funded in this program were new.</p> <p>NOTE: A new investigator is an investigator who has not been a PI on a previously funded NSF grant.</p> <p>Source: Jackets, EIS Web COV Module, Funding Rate filtered by PI Characteristics. EIS can show funding rates for proposals involving new investigators or with no involvement of new investigators but data are somewhat cumbersome and in the end a judgment is needed about appropriateness for the discipline in question.</p>	<p>YES</p>
<p>9. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Geographical distribution of Principal Investigators? <p>There was a very broad geographic distribution of awards and PIs. The panel felt this was not an issue the program should be concerned about.</p> <p>Source: Jackets, EIS Web COV Module, Funding Rate filtered by State</p>	<p>YES</p>
<p>10. Does the program portfolio have an appropriate balance of:</p> <ul style="list-style-type: none"> • Institutional types? <p>While most awards across programs are to PhD granting institutions, as expected, a fair number have been awarded to other institutions. Three awards from our relatively small sample were made over the past three years to bachelor degree granting institutions, while over the same time period four awards were made to UCAR, two to Master’s Degree granting institutions, two to non-profits, seven to private sector associations, three to small businesses, and one to a US government agency. Given this mix, the panel felt there was an appropriate mix in the portfolio of institutional types, and across programs.</p> <p>Source: Jackets, EIS Web COV Module, filtered by Institutional Type</p>	<p>YES</p>

<p>11. Does the program portfolio have an appropriate balance:</p> <ul style="list-style-type: none"> • Across disciplines and sub disciplines of the activity? • Across programs within the division? <p>In general, the answer to both questions is yes. The COV panel was pleased to see the program has taken the advice of the prior COV to balance the ANS and ARCSS programs, and the way in which they currently work together. The panel also applauds the decision to increase funding to ANS, ASSP and Education.</p> <p>The panel noted the recent dramatic increase in glaciology research in Greenland, and expects this trend to continue. As noted in C.1 below, research activity in the arctic may be expected to increase in the future, and ARCs should begin planning for additional growth in the number of submitted proposals.</p> <p>Source: Jackets, Program Information</p>	<p>YES YES</p>
<p>12. Does the program portfolio have appropriate participation of underrepresented groups?</p> <p>Some concern was expressed in this regard by the panel based on the sample of proposals available. The funding vs declines rate for female PIs was 43% compared to 51% for male PIs.</p> <p>There were only three proposals in our sample that identified the PI as a minority scholar, and two of these were funded.</p> <p>The ‘read ahead’ materials provided to the COV panel by the ASSP and ANS/ARCSS programs do address this issue in more detail than the selected ejackets made possible. In both cases, the program managers are aware of the underrepresentation of women and minorities as lead PIs in funded projects, but note that significant numbers of women and minorities are supported on projects as post-docs, graduate students, and undergraduate students. In the ASSP program, the only program to award Doctoral Dissertation Improvement Grants, the support of female and minority students is also increasing. Thus, the available information is encouraging that program managers are taking a proactive approach to increasing funding to younger scholars who are members of underrepresented groups, and that the proportion of senior PIs who are members of such groups may be legitimately expected to increase in the future.</p> <p>In the ASSP the effort to increase participation of under-represented groups in Arctic Science is also demonstrated by the fact that 13% of PIs are from underrepresented groups (primarily Native Alaskans), and 7/12 funded projects are community collaborative/partnership projects.</p> <p>Nevertheless, the panel feels it important for programs to encourage young scholars who are members of under-represented groups to apply for the post-doctoral funding mechanism to enhance professional development and increase the probability of future funding success.</p>	<p>NO, but improving</p>

<p>RECOMMENDATION: The program should assure that the post-doctoral funding competition is regularized, and that Program Officers effectively use this mechanism to facilitate the transition of underrepresented investigators from the status of trainees to senior investigators.</p> <p>Source: Jackets, EIS Web COV Module, Funding Rate filtered by PI Characteristics. Relatively few PI's self-report demographic information, so the sample size is low. A judgment based on jackets or by questioning PO's may be more useful.</p>	
<p>13. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports.</p> <p>Yes.</p> <p>Source: Jackets, Program Information, Highlights</p>	YES
<p>14. Does the division's award portfolio appropriately address division goals and NSF-wide strategic goals?</p> <p>Yes, on all counts. Stewardship would be enhanced by tracking statistics on student awardees. Stewardship is also accomplished in ASSP and through the broader impacts of several projects with respect to cultural stewardship, language recovery, etc.</p> <p>Although noted as a division goal, the COV panel identified only one or two jackets that related to the development of cyberinfrastructure, which is viewed as central to the overall strategic goal of Research Infrastructure. This suggests that OPP lags behind other components of the Foundation in this regard, and that the focus on this goal in the future is well conceived. Similarly, the creation of the AON program is directly relevant to the development and expansion of research infrastructure.</p> <p>Although proposals relating to cyberinfrastructure development were sparse in the selected pool (other than AON related proposals), they do seem to be coming in, and will likely increase in the future. By way of example, some of the highlighted projects from 2007-2009 relate to the development of cyberinfrastructure in arctic research (e.g., Center for Remote Sensing of Ice Sheets, Gogineni, PI, 0424589). For additional examples, see Section B below.</p> <p>Source: Jackets, Solicitations, NSF Strategic Plan</p>	YES
<p>15. Additional comments on the quality of the projects or the balance of the portfolio:</p>	

A.4 Management of the program under review.

Please comment on:

1. Management of the program, including IPY activity.

In general the program appears well managed. We are concerned about the long dwell times, but the COV agreed unanimously that the program is funding high quality research and has been responding effectively to an uncertain and rapidly fluctuating federal budget environment. Upper level management within OPP has been proactive in reallocating and rebalancing resources internally to focus on program priorities, and we see this as evidence of wise management and thoughtful stewardship. The development of an integrated logistics support unit for Arctic researchers (RSL) has resulted in expanded research opportunities for field-based Arctic research, and improved the efficiency of Arctic logistics by matching needs from diverse research groups. We were impressed that during the 3-year review period the number of researchers actively involved in arctic fieldwork has increased substantially. All in all, we see considerable evidence that the programs we reviewed are being managed diligently and effectively.

Source: Jackets, Program Information

2. Responsiveness of the program to emerging research and education opportunities.

Although there is a broad sense that the American response to IPY was slow, the program handled the influx of a large number of proposals effectively, and managed the NSF IPY effort in an excellent fashion. IPY represented an opportunity to enhance and stimulate the internationalization of the US scientific enterprise. The COV commends the division on its responsiveness to ARRA, effectively funding double the normal amount of science. RSL has been particularly responsive to researcher needs, and the addition of a second program officer for this program has been beneficial.

The number of SGERs, EAGERs, and RAPIDs funded during the review period indicates that the program is effectively supporting emerging research opportunities, just as the outreach efforts funded (e.g., workshops) supports education opportunities.

Source: Judgment from overall portfolio as represented by the jackets, Program Information

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio, including IPY planning, workshop recommendations and program officer interactions with the scientific community.

The COV was concerned that mechanisms promoting “bottom-up” generation of research initiatives appear to be scarce. We encourage OPP to support a ‘bottom-up’ approach to identify new research initiatives, an approach that appears to have been lost in recent years in the arctic research community. This could include funding more workshops to identify emerging research themes, holding All Hands meetings, etc. A focus on synthesis of research themes across disciplines would be of use. Additionally, it was suggested that many young investigators had been effectively entrained into the planning process through OPP funded workshops. Making sure that early investigators are included in the planning process of program development is an important consideration.

Source: Workshop reports (list on OPP web page), Solicitations, Program Information

4. Responsiveness of program to previous COV comments and recommendations.

The last COV recommended a checklist for reviewers and for Review Analysis. This was not done, and we received no real information on why this was not considered a reasonable strategy. The current COV had some reservations regarding use of a checklist for reviewers, but would have liked to have had some formal response.

The past two COVs recommended a reduction in size of the COV template, on the grounds that fewer questions for the COV would facilitate the review. In fact, the list of questions for COVs has increased. We recognize the template is a Foundation level document, and not under the direct control of individual programs or divisions. We suggest this issue be raised for discussion at higher administrative levels at NSF to facilitate COV reviews in general.

The review panel would have benefited from greater coordination with respect to information flow prior to the COV. Earlier access to electronic information, and earlier alerts that these are the basis for the COV review would be helpful. Standardize headers of emails so panelists can easily sort and keep track of information flow. Also, define who panelists should contact with particular questions (e.g., COV Chair, OPP Advisory Committee Chair, OPP Program Specialist, etc.)

Source: Updated 2006 COV response.

5. Additional comments on program management:

There has been a significant budget commitment from the Arctic program to support ARCUS, but no information was provided on the rationale, funding implications, role of ARCUS in program goals and outcomes, etc. The COV would need much more information on ARCUS to evaluate the program management implications of this investment. Given ARCUS' past activities, it might be productively linked to development of some of the 'bottom-up' activities noted above, e.g., sponsorship of emerging themes workshops, cross-disciplinary meetings, etc.

A5. Research Support and Logistics.

Please comment on:

RESEARCH SUPPORT AND LOGISTICS	APPROPRIATE, NOT APPROPRIATE ⁴ , OR DATA NOT AVAILABLE
<p>1. Has the level and quality of support provided through the Research Support and Logistics (RSL) program been appropriate for completion of the funded proposal?</p> <p>RSL is a comparatively new program, in its current configuration, and due to the nature of arctic fieldwork, accounts for a large proportion of the division budget. This is the first time RSL has been a part of a COV review, and as a result RSL staff provided much useful and additional information for the COV panel in order for us to develop a more robust view of the role of logistic support in specific proposals. Despite this effort by RSL staff, the COV was unable to evaluate the full scope of logistic support provided by the RSL. For example, the effectiveness of many logistics providers (e.g., DOI helicopters, ARCUS, CRREL, icebreaker science support) was not evaluated. Of the 136 proposals considered in the COV review, only 26 required support from the primary Arctic logistics provider (CPS) and only 7 of these had already been in the field with outbriefs available. Additional required support included icebreakers (6-7 proposals) or helicopters or other needs that were not clearly identified. For many of these proposals, successful logistic support of the project was difficult to evaluate because the project is still ongoing or because no information was available. Consequently, in the future there is a need for a more effective review process and data availability for a truly effective RSL review.</p> <p>Evaluation of the coordination with RSL was difficult also because many of the 136 proposals evaluated by the COV included no indication of coordination with RSL in the eJacket or other material so that evaluation of the role of logistics in the proposal review process was difficult. The COV Panel recognizes the value of keeping RSL planning and costs somewhat invisible from project reviewers, but such information should be easily available to COV reviewers via the ejacket system in order to facilitate future COV reviews. We also suggest that the program consider using a different temporal window for RSL reviews, e.g., 5 years rather than 3, with the most recent year no more recent than 1-2 years ago, since most recent year(s) will have no field work on which to base any evaluation of logistic support efficacy. Placing annual outbriefs in the ejackets would also streamline future COV reviews. Given the significant effort and budget commitment to RSL, the program might consider conducting a separate review of RSL, as is currently done in the Antarctic program, rather than entirely in conjunction with Arctic Science program COV, and to expand the proposals/projects considered in that review beyond the subset assigned to the core COV. However, the COV panel recognizes that integrating RSL review with the science review provides the most comprehensive assessment of program management and quality.</p>	YES

⁴ If “Not Appropriate” please explain why in the “Comments” section.

Some budgets were reduced due to RSL evaluation of logistics costs. In some cases this was due to lack of planning and knowledge of RSL issues and costs by the PI. In these cases, the panel felt the action taken (budget and project duration reduction) was appropriate and responsible. The panel couldn't actually evaluate RSL budget issues since most information provided by project reflected only CPS expenses, even though other logistic expenses are also frequently incurred.

The COV believes RSL needs to continue to monitor the transition to CPS as logistic provider at Barrow to ensure the process is smooth, and to ensure PI confidence in appropriate logistical support.

The recent dramatic increase in research presence in Greenland suggests CPS needs to increase focus and support levels for individual research programs located in Greenland. The one example of inappropriate logistic support to an archaeological project in northern Greenland is emblematic of the type of problem that is likely to increase without immediate attention to the increasing demands from Greenland researchers. However, after examining additional data, the COV is convinced this specific case is a clear outlier, completely atypical.

The COV notes that the outbriefs of the program are conducted by the provider (CPS). Some scientists might be reluctant to provide negative criticism directly to the provider, especially if they need to rely on CPS for continued logistical support. The program should consider ways to obtain independent assessments of provider logistical support. Based on the outbriefs from the proposals selected for the COV, and the annual report from 2008, PIs were almost unanimously pleased with the support provided by CPS (but note caveat).

It should be noted that the RSL is responsible for the budgetary authority of two of the USCG icebreakers, that this is a significant responsibility (the budget for this activity is approximately equivalent to or greater than the total regular RSL), and that this responsibility requires a not insignificant time commitment by the RSL PO. In general, support for icebreaker and large ship research has been commendable (both of the cruises supporting the Moran (0732680) and Sherr (0732301) proposals/projects were highly successful), although the inability to procure an icebreaker for the 2010 BEST spring sampling season will likely compromise the scientific goals. In general, the level of RSL support relative to other direct costs of arctic research appears appropriate. The COV believed also that the RSL was able to respond in a timely fashion to unanticipated needs, such as providing logistics to Shaver's study of the Toolik Fire Site (0856853).

The COV panel commends RSL for funding projects that will favorably impact future logistic needs and practices in arctic research (zero-emission snowmobiles). This is a proactive approach in a program that is often viewed as reactive. In similar fashion, assisting PIs in logistics and budgetary planning is a proactive approach that should minimize the need for reactive approaches once projects are funded.

Sources:

Science and facilities plans for field seasons 2007-2009 (still in preparation)

Graphics on support from CH2M HILL Polar Services (CPS):

Data on projects supported by CPS 2000-2009

Field projects by region 2000-2009

Projects supported by CPS by project funding source 2007, 2008, 2009

NSF projects by funding program 2007, 2008, 2009

IPY projects as a percentage of CPS supported projects

Outbriefs from projects included in the COV review

GNET station map

<p>2. Has the RSL program been able to adjust services to match unanticipated needs of funded projects?</p> <p>Despite budget shortfall due to change in policy in 2008, RSL was able to respond positively and constructively to funded investigators' requests. Several examples were provided of both positive and negative responses to investigator requests. The former clearly outnumbered the latter in the 2007-2009 timeframe.</p> <p>Sources: Descriptions of unanticipated needs that were met by RSL; and descriptions of unanticipated needs that RSL declined or was unable to meet</p>	YES
<p>3. Has the RSL program demonstrated the capability to respond to emerging community needs in a reasonable time frame?</p> <p>A number of examples of request for logistical support that have arisen on a short timeframe were provided to the COV by RSL staff. We also obtained considerable information regarding this issue in the CPS outbriefs. While most relate to individual project needs, at least one instance related to an unanticipated research opportunity that required very rapid RSL response. This was accomplished, suggesting that RSL does have the capacity to respond to emerging community needs in a timely fashion.</p> <p>Source: Jackets</p>	YES

PART B. RESULTS OF NSF INVESTMENTS

The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship. The COV should look carefully at and comment on (1) noteworthy achievements based on NSF awards; (2) ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcome goals; and (3) expectations for future performance based on the current set of awards.

NSF investments produce results that appear over time. Consequently, the COV review may include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made.

To assist the COV, NSF staff will provide award "highlights" as well as information about the program and its award portfolio as it relates to the three outcome goals of Discovery, Learning, and Research Infrastructure. The COV is not asked to review accomplishments under Stewardship, as that goal is represented by several annual performance goals and measures that are monitored by internal working groups that report to NSF senior management.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: “Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering.”

The vast majority of funded proposals are of excellent quality. Recent funding increases (e.g., ARRA) permitted support of even more high quality research than could have been supported otherwise. Despite the constraint of focusing our review on recent, non-completed projects, a number of very high quality projects that meet the discovery outcome goal could be identified.

An example of a funded project that took advantage of an unanticipated opportunity is the SGER award to G. Shaver, Marine Biological Laboratory (NSF 0808789), which took advantage of a 1000 acre fire at the Anaktuvuk River to identify the impact of wild fire on carbon and nitrogen cycles. This short-term opportunity project lead to an “*estimate of C (from peat) loss due to the burn itself of more than 2 M ton, about equal to the annual C "footprint" of a US city the size of Boston*”. “*increasing fire in tundra areas may prove to be a major cause of disruption, both of ecosystems and atmospheric balance*”

An increase in awards to proposals that were highly rated, but previously may not have been funded, was possible in 2009 through the ARRA funding to NSF. This bolus of support may have enhanced the funding of potentially risky but high pay off projects and young investigators. An examples of such a project that may not have been funded in previous competitions is: “*Arctic Ocean redox history and Hg cycling using redox-sensitive trace metals and Hg isotopes: the influence of sea ice*” lead by James Gleason, an early career researcher (this was his second successful NSF proposal) 0909264.

Polar Programs is also supporting state of the art research in paleoclimate investigations with lake sediment cores. A newly awarded PI, Kaufman et al. (2009), 0909332, “documented that the past decade was the warmest for the last 2,000 years by using high resolution Lake sediment, ice core, and tree ring records from multiple sites across the Arctic.” The results of this project were also effectively communicated to the general science community via publication in Science; Kaufman DS, et al. (2009) Recent warming reverses long-term Arctic cooling. Science 325:1236–1238.

Many of the highlights listed for 2008 relate to climate change and ecological transformation in the arctic, many with societal implications. Several have been identified as transformational. In the Social Sciences, as well, a number of transformational projects have been identified by reviewers, program officers, and are noted in the NSF highlights; including projects that challenge the conventional view of the original colonization of the Americas (Dixon, 0703980), identifying commonalities of human communities adapting to high latitudes as well as high altitudes (Huntington, 0822736), or research into paleoclimatic reconstructions that examine the relationship between arctic climate change and cultural processes among the prehistoric Maya (Zubrow/Smyth, 0940183).

As noted by ASSP PO Anna Kertulla, many projects may not be explicitly transformational, but nearly all have the potential to transform individuals, epistemologies, and paradigms. In this sense, the outcome goals of discovery (and learning, see below) are more than met by many, if not most, funded projects.

B.2 OUTCOME GOAL for Learning: “Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.”

Polar Programs effectively engages native Arctic communities in a number of research programs. One outstanding example of this is the Bering Sea Sub-Network (BSSN), led by Victoria Gofman, Aleut International Association (NSF 0634079) that entrains Aleut, Yupik and Inupiaq as researchers in their own

communities. *“BSSN is notable for its success in bringing together indigenous people and scientists in the development of a research-driven community-based observing network that meets both sides' needs. BSSN promotes intellectual and cultural connections among groups of people who have diverse backgrounds yet share similar concerns about their changing environment.”*

Other examples are: Shari Gearheard's IPY funded project (0753854), “IPY: Collaborative Research: Linking Inuit Knowledge and Local-Scale Environmental Modeling to Evaluate the Impacts of Changing Weather on Human Activities at Clyde River, Nunavut”, which engages three academic institutions, Alaska Native, and Canadian First Nations communities in developing new tools for data collection and analysis of climate data using traditional knowledge to inform scientific methods development.

Barbara Bodenhorn's project (0813635), funded by the Arctic Social Science Program, supports an annual exchange of high school students from indigenous communities in Mexico and Alaska, who participate in climate change research along side both US and Mexican scientists, and who also benefit from immersion language experience. In addition, research on the education aspects of this workshop takes place in each exchange. A number of the young attendees have developed ongoing interests in science education and careers.

The Virtual Zooarcheology of the Arctic Project (lead by H. Mascher, Idaho State University) is making faunal collections from Northern archeological excavations available to researchers and schools. *“VZAP will also provide an in-depth resource for teaching and learning skeletal biology by providing access to an interactive virtual collection which can be used both inside the classroom and for laboratory studies”*

Each of these projects, and others that could have been listed, contribute to the expansion of the scientific literacy of all citizens and are broadly inclusive of the scientific and engineering workforce – key components of the outcome goal for learning.

B.3 OUTCOME GOAL for Research Infrastructure: *“Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools.”*

The arctic science program addressed this outcome goal directly with the creation of the Arctic Observing Network (AON) program, the effect of which was to maintain observing network programs in arctic that were at risk, especially the long-term maintenance of climate records. AON outcome goals are to advance polar science by launching new initiatives, develop and expand international partnerships; leave a legacy of data and/or infrastructure for polar observations - including comprehensive data management plans.

Two additional examples of the programs emphasis on achieving this outcome goal are the construction of a new dining facility at Toolik Field Station in north Alaska which will put in place the infrastructure to permit year-round use of his research site, and the addition of a new staff member to stimulate development of new cyberinfrastructure initiatives. Regarding the latter effort, it would be useful for the program to develop a cyberinfrastructure roadmap. Ensuring data accessibility and quality are key components of NSF's outcome goal of Research Infrastructure, which may be directly impacted without an enterprise architecture approach to cyberinfrastructure development.

Several individual funded projects also illustrate the program's commitment to developing research infrastructure, including the following:

“Not only is Dena'ina language endangered; Dena'ina language data are also endangered.” The Dena'ina Archiving, Training, and Access (DATA) web portal (PI: Helen Aristar-Dry, Eastern Michigan University, NSF 0326805), Qenaga.org, is preserving the ANLC holdings of the Dena'ina language and making these accessible to the communities of Dena'ina speakers.

“By integrating the three pillars of archiving, training, and access the DATA project has served as a model for the development of electronic archives of other Alaska Native language materials.”

“Under NSF's direction (NSF program manager Patrick Haggerty 0520837), the research community and the logistics provider, CH2M Hill Polar Services (CPS) are updating a redevelopment plan for Summit Station that will move the station toward a low-energy, efficient station that meets the year-round needs and can accommodate a seasonal influx of researchers.”

In sum, the program appears to be more than meeting the expectations for all three outcome goals.

PART C. OTHER TOPICS

C.1. Please comment on any program areas in need of improvement or gaps (if any) within program areas.

Due to global climate change, arctic science programs should anticipate a continued increase in proposal submissions in all areas. If planning has not already begun to anticipate the continued increase in proposal submissions, it should begin immediately.

One COV panelist noted that comments from colleagues indicated some concern regarding support for glaciology research. There is a glaciology program in the Antarctic division, and the ANS/ARCSS programs support glaciological research in the arctic. Hence, glaciologists studying mid- and low-latitude glaciers appear to have no specific program to which they submit proposals at NSF. While this is a topic of discussion and perhaps concern for some glaciologists, the majority of the COV panel did not consider it a serious, structural problem for arctic sciences. The same situation applies to many disciplines. Nevertheless, it is occasionally useful to reevaluate program structures and solicitation scope. Given the rapid melting of glaciers and ice caps and their immediate effect on global sea levels, it may be opportune for OPP to evaluate whether a different structure for supporting glaciological research would benefit the science, or provide a clearer intellectual home for glaciological research at the Foundation. The COV panel makes no specific recommendation in this regard, but alerts the program to ongoing discussions in the research community. Perhaps a community meeting organized within the Cryosphere Sciences Focus Group at AGU's Fall Meeting would be an appropriate avenue for NSF to be appraised of any community concerns regarding funding opportunities, and to articulate NSF's current programmatic goals for glaciological research.

C.2. Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

It was not clear to the COV reviewers how program goals are set, how they are changed, or if there is a formal process guiding programmatic development. Identifying how program goals are identified and adopted would help the COV in evaluating questions relating to program balance and continuity.

The effectiveness of the Arctic Social Science Program in achieving program goals has been addressed earlier. For the Environmental Science programs [ANS/ARCSS] the goals are to understand arctic processes and develop predictive tools (ANS), while ARCSS strives to understand arctic systems as a whole, with a focus on the environment. Together, these programs target observable changes in the arctic and aim to explore the consequences, feedbacks, and tipping points for both environments and inhabitants. The programs have consistently funded excellent scientific research, and outreach has raised public interest in arctic science. This is seen especially in IPY projects, but also through investments in BEST, CSAS, and individual projects.

C.3. Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

The COV review panel identified a clear need to update, and perhaps modify, the NSF database to make it more accessible to COV reviewers in formats that are useful; e.g., tracking student and post-doctoral support, and linking Co-PIs to lead PI so they don't appear as multiple proposals. The COV panel felt that additional mechanism(s) to alert research communities to new solicitations would be most helpful and responsive to diverse research communities, especially for new, young investigators. For example, creating an email list investigators can subscribe to, or posting the ARCUS list information on the OPP website.

C.4. Please provide comments on any other issues the COV feels are relevant.

The COV panel discussed the widely recognized observation that the Arctic System is changing more rapidly than any other region of the Earth System, with potential global consequences. We noted that this is likely to result in expanded activity within the research community for which the post-ARRA level of funds within OPP-Arctic are unlikely to be sufficient to support the increased array of excellent proposals. A substantial increase in research investments by OPP through both IPY and ARRA has mobilized many first-time Arctic researchers to focus their attention on understanding Arctic change. The COV recommends that OPP explore opportunities to meet the anticipated increasing resource demands that are likely to stem from the acceleration of Arctic change and the new researchers now active in the Arctic.

C.5. NSF would appreciate your comments on how to improve the COV review process, format and report template.

If the increase in data and documentation suggested in this report is adopted for future COV reviews, an earlier release of such documents to COV panelists would be advantageous. Similarly, most COV panelists have experience on program review panels, but not on prior COVs, so some guidelines on the different roles and expectations of the two types of review panels – provided at the time documentation is distributed – would be helpful to COV participants. It would facilitate anticipation of the review process as well as guide COV panelists to the most effective pre-COV preparation.

Have issues raised by the last COV been adequately addressed?

In general, the program appears to have taken the last COV set of recommendations very seriously, and responded to most of them in a positive and productive fashion. One recommendation made by the last COV, that of a reviewer checklist, was not adopted, and no specific explanation for why was offered by the program in a fairly extensive response document. The current COV did not feel this was a particular problem since the majority of the 2009 COV members were not convinced that this was an effective way to achieve the goals for which it was suggested. The previous COV did suggest that dwell time of proposals in arctic science was a problem, and it has remained. We also suggest ways to address this problem, ones we hope will not adversely impact PO workload, but which will be beneficial to PIs. Finally, the last COV also noted the anticipated increase in submitted proposals as a result of research activity in the arctic associated with global climate change and its dramatic effects in high latitude environments. The 2009 COV agrees this is still an issue and needs to be addressed by the program. That said, the program was fairly effective in dealing with the increased proposal load as a result of IPY and ARRA over the past 2-3 years, so the infrastructure and program management practices may already be in place to handle the expected continued increase in proposal submissions.

In summary, the 2009 COV panel offers the following recommendations that we believe will benefit the Arctic Sciences Division, and investigators it funds. The background and rationale for each of these summary recommendations may be found in responses to specific questions in the COV template above.

RECOMMENDATION 1:

To proactively reduce dwell time

- a) process the obvious declines as soon as possible after panels; simply processing the obvious declines two weeks earlier would result in ~60% of proposals being cleared within six months,
- b) for the period 2009-2012, track these dwell-time metrics at the end of each specific solicitation to evaluate whether the issue is being adequately dealt with, and
- c) consider whether moving back to 2 target deadlines per year instead of 1 would significantly affect dwell time without other negative impacts.

RECOMMENDATION 2:

Consider evaluating the RSL program on a longer time-frame (e.g., 5-6 years) than the standard three year window used for COV reviews of science programs. Such a short, recent window for review fails to capture much of the work of the logistics program for individual projects and hampers adequate review.

RECOMMENDATION 3:

Make the bulk of the content in the Review Analysis available to PIs (with reviewers' names excised). These documents are much richer with respect to the decision making process and review weighting components that are often missing from the panel summary. Providing Review Analysis or similar document to PI in case of declines will help avoid the common practice of misinterpreting the overall significance or weight of individual review and panel comments in the final decision. Having more complete analysis would allow resubmissions to be targeted more effectively where the most benefit to the science could result most easily.

The COVs concern with this recommendation is that POs might feel constrained in preparing Review Analyses for public consumption, and their quality and informativeness would correspondingly decline. This would defeat the purpose of the recommendation. The COV review panel also does not want to increase the already heavy workload of the POs. An alternative is to formally encourage POs to rely heavily on their Review Analyses in communicating the results of panel deliberations to PIs (e.g., by 'cutting & pasting' sections of the Review Analysis into the email notifications).

RECOMMENDATION 4:

Whenever possible, obtain at least three ad-hoc reviews in addition to a panel evaluation, thereby minimizing the use of panel-only reviews. The COV's opinion was that ad hoc reviews in combination with panel review led to the best science being funded and to the best and clearest documentation of those funding decisions.

RECOMMENDATION 5:

The program should assure that the post-doctoral funding competition is regularized, and that the Program Officers effectively use this mechanism to facilitate the transition of underrepresented investigators from the status of trainees to senior investigators.

SIGNATURE BLOCK:



Arctic Sciences Division
Committee of Visitors
Dr. Dennis H. O'Rourke, Chair